7 Electrical Distribution System

The electrical distribution system in Puerto Rico, which is installed on wood or concrete poles, was severely damaged by Hurricane Georges. The loss of electrical service to water treatment plants resulted in widespread disruption of the delivery of water, which directly affected people's personal lives. Loss of electrical service also resulted in major economic disruption and significantly increased disaster response needs.

Damage of the distribution and in the transmission systems fell into the following areas:

- Broken wood poles: This was caused by too great a load on the pole, including too large a span or various heavy communication lines on the poles (Figures 7-1 and 7-4).
- Leaning poles (wooden and concrete): This was considered minor damage and was easily corrected by straightening and properly embedding the poles in the ground (Figure 7-2).
- Broken concrete poles: Round spun concrete poles generally perform better than the reinforced concrete poles that are widely used in Puerto Rico. There was evidence of spalling and cracking of reinforced concrete poles indicating a probable quality control problem (Figure 7-3).
- Fallen poles: This was a result of improper embedment. Additional damage occurred to the conductors, causing progressive failure to other poles.

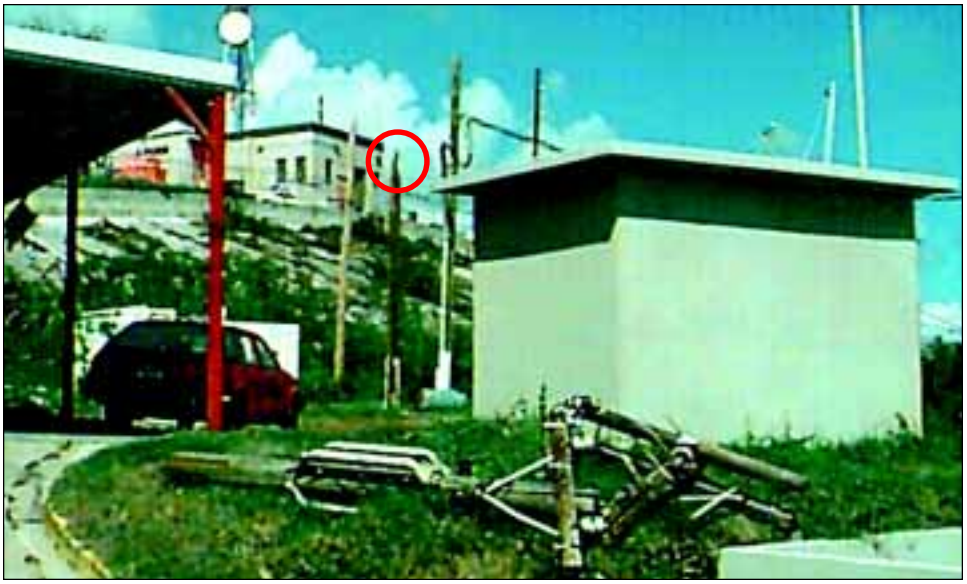

FIGURE 7-1 Damaged wood pole. The portion of the wood pole in the foreground broke from the pole (circled) in the back of the picture.

FIGURE 7-2 Leaning wood pole due to inadequate embedment.

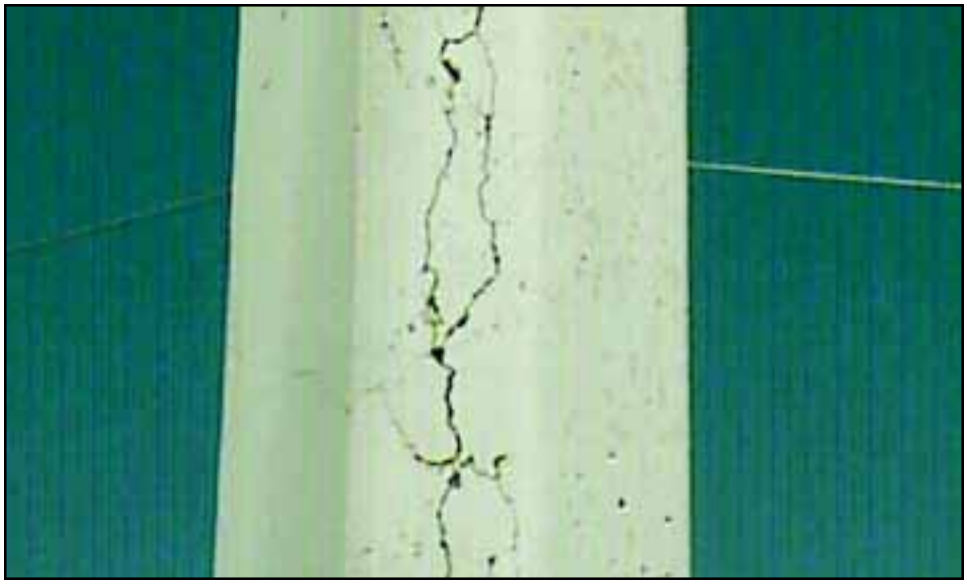

FIGURE 7-3 Observed crack in concrete pole that appears to be a quality control problem.

FIGURE 7-4 New wood pole replaced after the hurricane; utility lines are still being attached to the pole. Inset shows wood pole grade marking. This #3 pole was typical of those used throughout the island.